N° 13,509 A.D. 1913

(Under International Convention.)

Date claimed for Patent under Patents and Designs Act, 1907, being date of first Foreign Application (in France), 19th June, 1912

Date of Application (in the United Kingdom), 11th June, 1913

At the expiration of twelve months from the date of the first Foreign Application, the provision of Section 91 (3) (a) of the Patents and Designs Act, 1907, as to inspection of Specification, became operative

Accepted, 22nd Jan., 1914

COMPLETE SPECIFICATION.

Improvements in Machines for Measuring and Packing Powdered Material.

We, SOCIÉTÉ MENIER, of 56, rue de Châteaudun, Paris, in the Republic of France, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention has reference to an improved machine for measuring and packing powdery materials and more particularly oily powdery materials for food or not, as for example, powdered chocolate.

It has heretofore been proposed to provide a machine for automatically measuring and packing powdered materials in which the material falls out of a hopper into a horizontal intermittently reciprocated plunger or measure which discharges its contents into a chute or funnel disposed above a bag or the like adapted to receive the measured quantity of material, said plunger being fitted with a rear plate for closing the outlet of the hopper when the plunger moves away from same towards the chute, and which chute is tapped or shaken by cam mechanism to ensure that the whole of the material passes therethrough. It has also been proposed to provide a similar type of machine with a reciprocatory measuring device which is tipped to empty its contents into a funnel, and with a flexible scraper to remove the surplus material on top of the measuring device as the latter moves towards the funnel. Again, it has been proposed to provide other types of measuring machines in which hoppers discharge into measuring devices, said hoppers being vibrated or shaken to enable the material to pass therethrough. Further, a rotary measuring machine has been proposed in which a plurality of open measuring vessels are turned or moved from a charging position to a discharging position wherein they are inverted to deliver their contents into a hopper.

According to the present invention the parts of the machine are of improved construction, combination and arrangement as hereinafter described by way of

[Price 8d.]

example with reference to the accompanying drawings, and as claimed. In the drawings:—

Figure 1 is a vertical and longitudinal section showing the arrangement and the general working of the component parts of the machine.

Figure 2 is a partial plan with section along the line A—B of Figure 1.

Figure 3 is the separate plan of the carriage and the measuring buckets provided thereon.

Figure 4 shows in elevation one of these buckets on a large scale.

Figure 5 shows in elevation and in plan the method of mounting these measuring buckets and the method of maintaining them in the filling position.

Figure 6 is a part vertical section showing one of the buckets whilst passing beneath a scraper for removing the excess of material supplied from a distributing hopper.

Figure 7 is another part vertical section showing the emptying of one of the measuring buckets into a funnel provided underneath with a small packing box.

The machine thus shown essentially consists of measuring buckets 1 arranged in a line (Figure 3) on a transporting carriage 2 mounted on rails. These buckets are of a volume corresponding to a given weight of given material. They are preferably cylindrical (Figure 4) with projecting circular ribs 1^a and inserted in spring clips 3 appertaining to a shaft 4 (Figures 3 and 5) capable of turning on the transporting carriage 2. This shaft 4 is provided at its ends with toothed pinions 5, and with locking devices 6, 6 adapted to co-operate with catches 6^a on spring bars 6^b for maintaining the buckets 1 in their filling position (Figures 1, 3 and 5).

The transporting carriage 2, provided with rollers 2^a facilitating its displacement on fixed rails 7, is connected by means of a link 8^a to a swinging lever 8 exposed to the action of a rotary cam 9 intended to impart to the said transporting carriage the various necessary movements. A counter-weight 9^1, or any other suitable arrangement, constantly tends to draw the transporting carriage backwards.

The feeding hopper 10 is arranged above the transporting carriage 2 opposite the line of measuring buckets in filling position. One of its walls is provided with a plate 11 with transverse vibratory movement intended to stir up the material, the tendency of which is to agglomerate, and to facilitate its passage through the outlets of the hopper. The plate 11 is spaced from the hopper wall by angle pieces 11^b Figure 2 and suspended within the hopper by threaded rods 12 (Figures 1 and 2) permitting of regulating as regards height the position of its lower edge which is suitably cut out at 11^a Figure 2 so that the material flows exactly into the measuring buckets underneath. Between these cut out or notched portions the plate 11 is provided with blades 13 intended, owing to the vibratory movement in which they participate, to prevent the formation of bridges which might occur in the material between the outlets 11^a. The upper threaded ends of the rods 12 are adjustably mounted in brackets 10^a secured to the hopper and adjusted by means of fly nuts 12^a, said rods being sufficiently flexible or the brackets slotted to allow for the vibratory movement of the plate 11. This movement can be effected by means of a rotary cam 13^a and of a suitable spring transmission (Figures 1 and 2) comprising, for instance, a roller 32 on a rod 33, a spring 34, rod 35, pivoted bell-crank lever 36, connecting rod 37 and a finger 38 secured to the plate. The cam 13^a which is formed with a partly undulated periphery 13^b only acts during the filling period of the buckets. It will be seen that the buckets are overfilled, a natural heap being formed at the upper part of the buckets. The material in excess falls into a receptacle 14 from where it is again taken and poured into the hopper 10.

In front of the hopper 10 is situated a bar 15 vertically adjustable and fitted with a plurality of flexible scrapers 15^a equal in number to the buckets. When

the filled buckets are carried along by the carriage 2 moved by the cam 9, the scrapers 15ª move across their upper portions (Figure 6) thereby causing the material in excess to fall into the receptacle 14. In this manner the volumetric measurement is regulated and the buckets only carry along with them strictly measured quantities of material corresponding to a given weight. The error in weight has been found to be practically insignificant even for very small quantities of material.

As soon as the buckets that have been filled leave the hopper 10 a small shutter 16 is automatically applied beneath the latter to avoid any useless discharge of material, although there is not much danger of this owing to the stoppage of the vibratory movement of the plate 11. This shutter, pivoted at 16ª to the back of the hopper, can be brought into the closing position (Figure 6) by bars 17 carried by the carriage 2 (Figure 3) or by any other means. The shutter 16 may if desired be dispensed with without thereby entailing any serious disadvantage.

In any case the carriage 2 with its measuring buckets continues to move forward until the moment in which its roller 2ª strike against stops 18, 18 fastened to the rails 7, 7. The cam 9 is so shaped that this must happen. It will be noticed, however, that the stops in question form elongated hooks extending in horizontal direction and preventing the lifting up of the front of the carriage 2 during the latter portion of its forward movement, and that on the other hand the toothed pinions 5, 5 keyed to the bucket shaft 4 have meanwhile engaged with the racks 19, 19 fastened to the rails 7, 7. It will also be seen that owing to this engagement the shaft 4 will be turned through half a revolution, thereby overturning the buckets (Figure 7) arranged in line, so as to empty their contents into fixed funnels 20. If boxes, cases, packets or the like 20ª have been arranged beneath these funnels it will be seen that the substance or material measured thus precisely will be packed, bagged or placed in boxes with the utmost rapidity. The bars 17 would be of sufficient length to maintain the shutter 16 in closing position whilst the buckets are discharging. Finally, in order that the contents of the buckets may be integrally filled into boxes, bags or cases, and in order to avoid small portions of the measured material sticking to the walls of the buckets and even of the funnels 20, flexible rods 21 knock against the buckets and funnels during the discharge of the said material. These rods are fitted to a bar 22 provided with slotted quadrants 22ª at its ends and loosely mounted on levers 23, 23 pivoting at 24 (Figures 1, 2 and 7) and fitted at their free ends with a loosely mounted shaft 25 parallel to the bar 22 and carrying cams 26 intended to act on arms 22ᵇ formed on the bar 22 for the purpose of imparting to the same and to the rods 21 a suitable vibratory movement. At one of its ends the shaft 25 has a toothed pinion 27, Fig. 2, for the purposes hereinafter described.

Until the period when the buckets 1 are being overturned the levers 23, 23 are held in the position shown in Fig. 1 by means of springs 28 connected to the arms 23ª formed on said levers and to brackets 28ª, in which case the rods 21 are inactive. During the period in which the buckets are overturned curved rails or curved slopes 29 fastened to the sides of the carriage 2 encounter and press against rollers 30 carried by the levers 23 which are consequently inclined forward (Figure 7), this being effected in such conditions that the pinion 27 on the shaft 25 engages with a toothed wheel 31 fitted on one side of the machine and which is continuously rotated from the shaft 31ª by means of a belt or the like 31ᵇ. The rotation of the wheel 31 is then transmitted to the pinion 27 and consequently to the cam shaft 25 and the cams 26 thereon, so as to impart a vibratory movement to the flexible rods 21, so that they strike simultaneously against the bottoms of the buckets 1 and the tops of the funnels 20 for the purpose of avoiding any possible adherence in the buckets and of emptying the funnels of all the material discharged from said buckets.

On the return of the carriage 2 backwards occasioned by the cam 9 and

weight 9' the inclined planes 29, 29 release the levers 23, 23, which are then raised under the action of their springs 28, the pinions 5, 5 turn in opposite direction and thus bring back the buckets 1 into their filling positions (Figure 5), and the shutter 16, if such is employed, is released by the bars 17 and leaves the outlet of the hopper 10 free beneath which the said buckets pass to be filled again. Then the above-mentioned movements are uninterruptedly renewed until the stoppage of the cam shaft 9". It will be seen that when moving forward the carriage 2, owing to the shape of the cam 9 at 9^b, is stopped for a short time before the turning over of the buckets 1, so that the attendant of the machine can control the filling of the buckets.

It must be understood furthermore that the machine described above may be made of any dimensions and its transporting carriage 2 may be provided with any number of buckets 1 and consequently of scrapers 15", funnels 20 and striking rods 21. This machine may also be provided for the control or coming into work of its component parts by means differing from those merely shown by way of example; thus the cams 9 and 13" as well as the transmissions 8, 8"; 32—38, to the carriage and the movable wall 11 of the hopper 10 can be replaced by other mechanical means which will in nowise affect the principle of the invention.

It is also evident that the hopper 10 instead of having only a single movable wall may be provided with two such walls actuated if desired in opposite directions. The walls of the hopper may be made of flexible or elastic material, such as rubbered canvas, parchment, skin and the like, mounted in suitable frames so as to be flexible or elastic and capable of changing the supporting points of the powder mass for the purpose of breaking any bridges that might be formed in this mass owing to the tendency to the agglomeration of certain parts when they remain immovable. These flexible walls may be vibrated by the means described for vibrating the wall 11, that is, if fingers such as 38 are secured to said flexible walls.

Furthermore the walls may also be formed by flat sacks into which compressed air can be sent by impulses, so as to occasion slight swellings followed by slight depressions, thereby imparting to the walls a to-and-fro movement for the purpose of fulfilling the purpose referred to above.

Finally, instead of the machine being single acting, such as that described, it may be of double action, so as to increase its production without, for that reason, employing much greater motor force. It suffices to arrange the two ends of the machine in the same manner as that regarded as the front of the machine in what precedes and to provide the carriage with two lines of buckets symmetrically arranged, in which case the carriage will be driven from the centre and not from the back. One of the lines of buckets will be in the filling stage at the hopper 10 whilst the other line is being overturned and emptied.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A measuring and packing machine for powdery material, more particularly oily powdery material (chocolate and the like) or material capable of agglomerating or of forming balls or heaps, in which the material is volumetrically measured in a bucket or receptacle the capacity of which is dependent on the weight to be obtained and the density of the material to be measured; the filling of the bucket is effected by means of a fixed hopper within which vibratory movements are imparted for preventing the bridging or packing of the material therein and assisting its distribution therefrom; the bucket is moved from the filling hopper to an overturning position; the material is scraped away at the upper portion of the bucket during the movement of same so as not to exceed the determined volume; the bucket is overturned at the overturning position into a packing funnel, and the bucket and funnel are vibrated so as to assist the flowing away of the material into boxes, cases or the like.

2. A machine as claimed above, in which one of the two longitudinal walls, or both, of the hopper have a transverse shaking movement for the purpose of occasioning a vibration causing the flowing away of the material and thus preventing, owing to blades fitted on the said wall or walls, the formation of balls or bridges above outlets of the hopper.

3. A machine as claimed in the preceding claim, in which the vibratory wall or walls of the hopper is or are formed of flexible or elastic material, or of flat sacks exposed to the action of a pulsation of air, so as to occasion changes in the points of support for the powdery mass and thus distribute and consequently break up any bridges that may be formed owing to the natural tendency of the mass to agglomerate when at rest.

4. In a machine as claimed in Claim 1, a plurality of measuring buckets removably mounted in line on a common shaft loosely mounted on a carriage, which carriage is adapted to move to-and-fro and to carry the buckets from the distributing hopper to a line of fixed packing funnels, and toothed pinions on the ends of said shaft for engagement with fixed toothed racks for the purpose of overturning the buckets at the end of their forward movement so as to discharge their contents into the said funnels.

5. In a machine as claimed in the preceding claim, a line of adjustable flexible scrapers beneath which the buckets pass, the excess of material forming heaps on the tops of the buckets being thus wiped or scraped off.

6. In a machine as claimed in Claim 1, a rod adapted to strike against the bucket when the same is being overturned into the packing funnel, and mechanism connected with said rod to impart to same at this moment a vibratory movement for striking against the bottom of the bucket and at the same time against the funnel for the purpose of occasioning the total discharge of their contents and the passage of the latter into the boxes, cases or packets.

7. The improved machine for measuring and packing powdered material constructed, combined and adapted to operate substantially as described with reference to the accompanying drawings.

Dated this 11th day of June, 1913.

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323, High Holborn, London,
Agents for the Applicants.

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A.D. 1913. JUNE 11. N° 13,509.
SOC. MENIER'S COMPLETE SPECIFICATION.

(2 SHEETS) SHEET 1.

[This Drawing is a full-size reproduction of the Original.]

FIG-1-

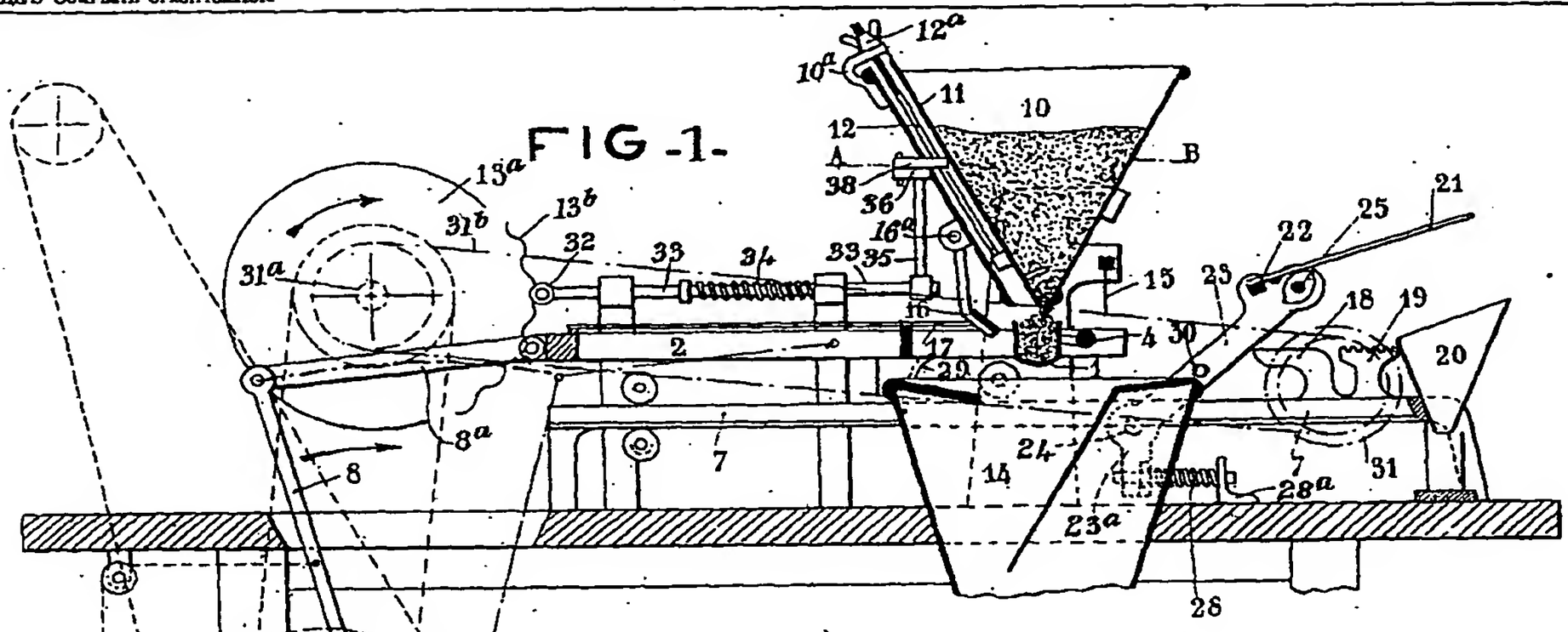

FIG-3-

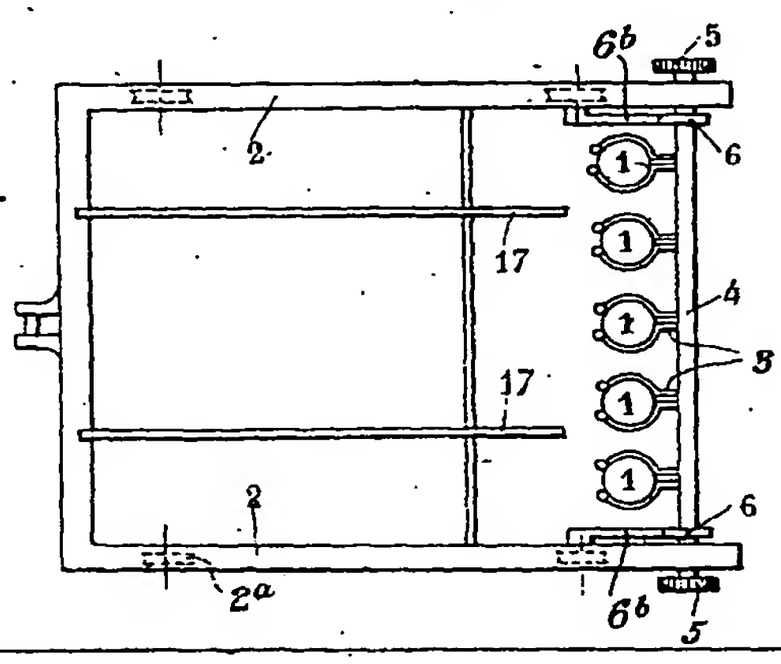

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FIG-1-

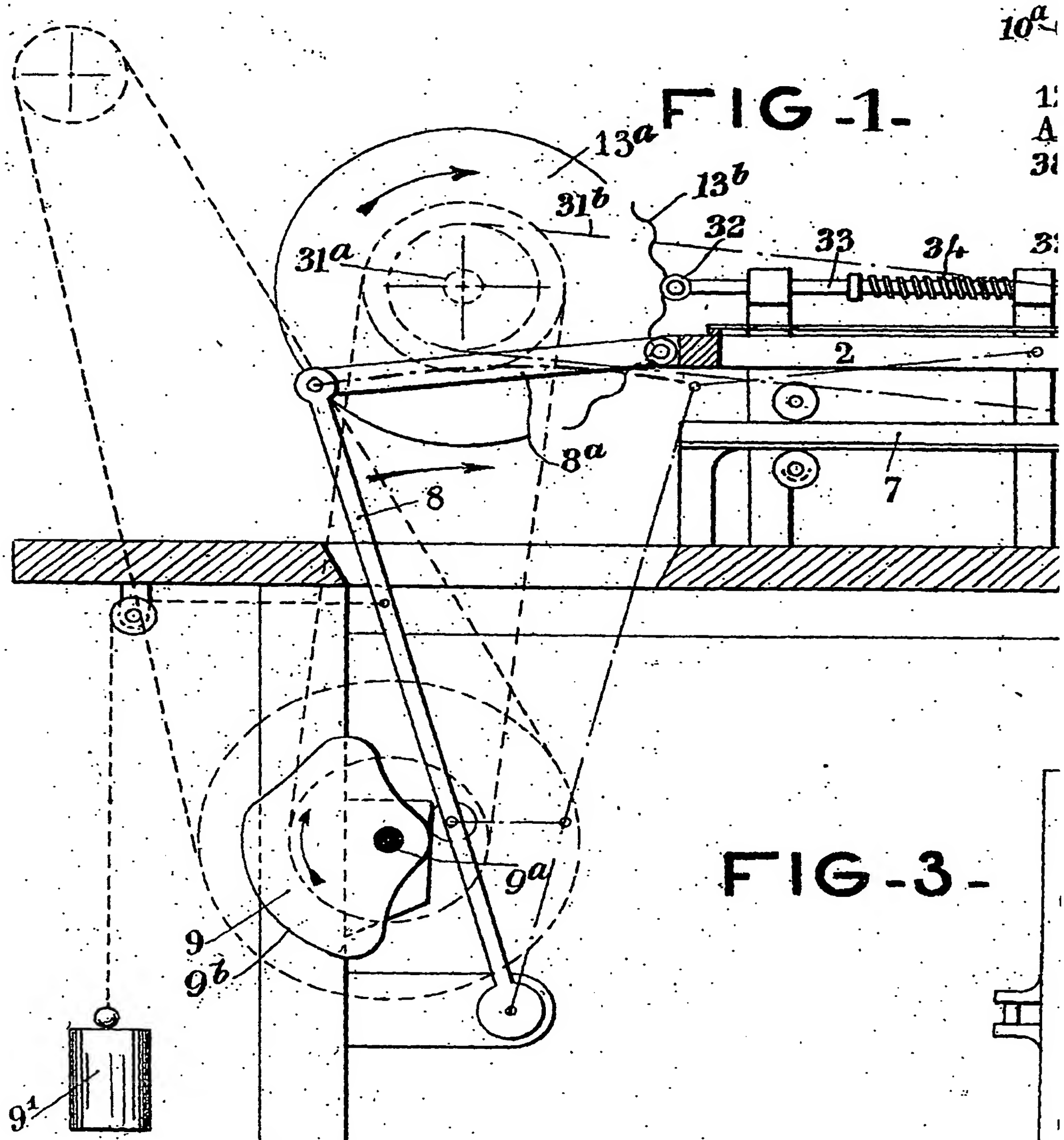
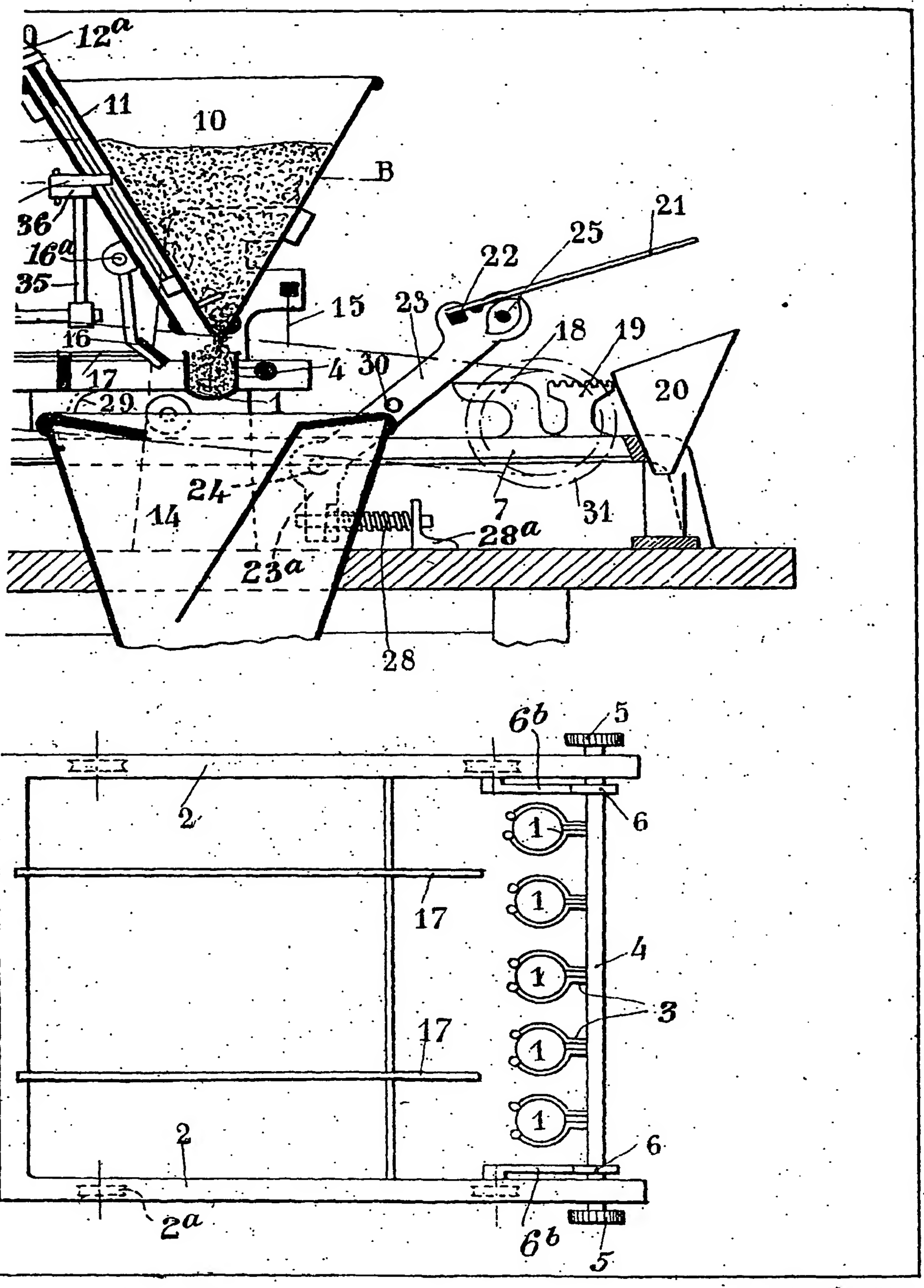


FIG-3-

(2 SHEETS)
SHEET 1.



A.D. 1913. June 11. N° 13,509.
SOC. MENIER'S Complete Specification.

(3 SHEETS) SHEET 2

[This Drawing is a full-size reproduction of the Original.]

FIG - 2 -

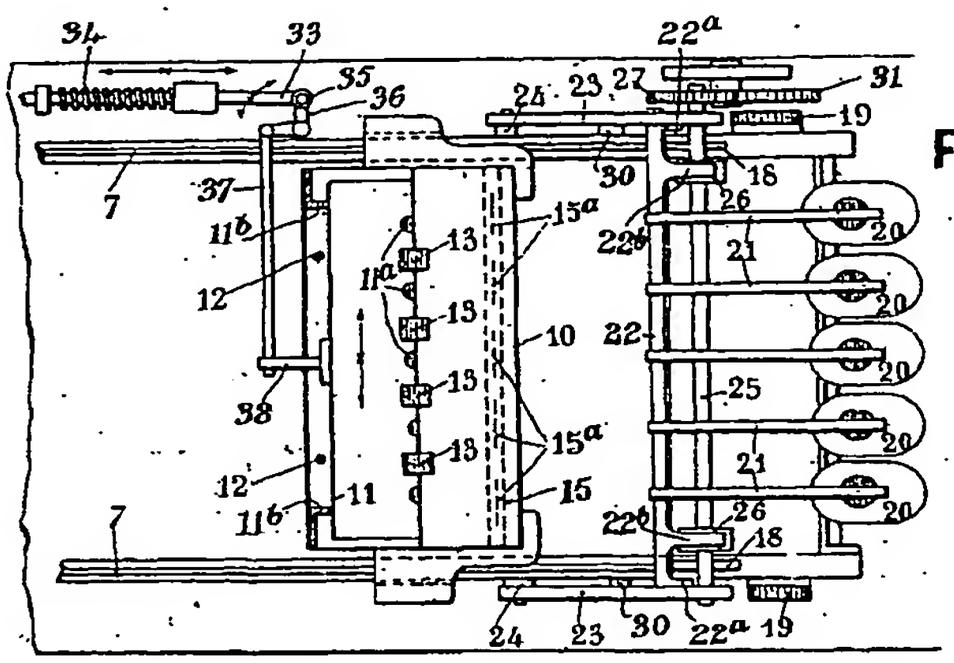


FIG - 4 -

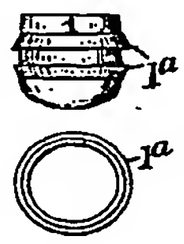


FIG - 5 -

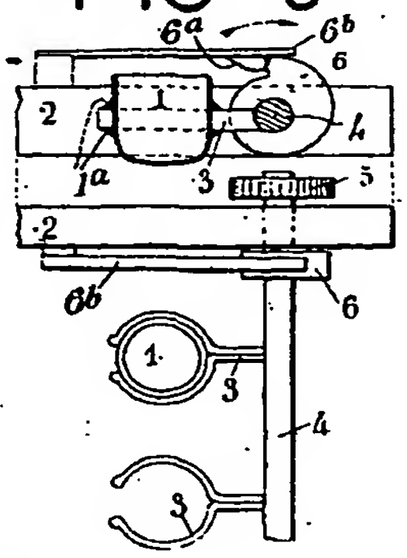


FIG - 6 -

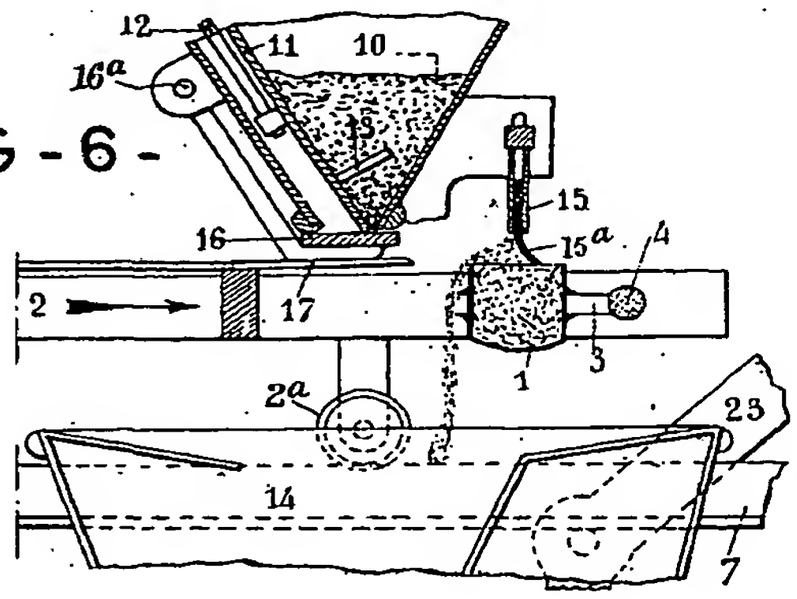


FIG - 7 -

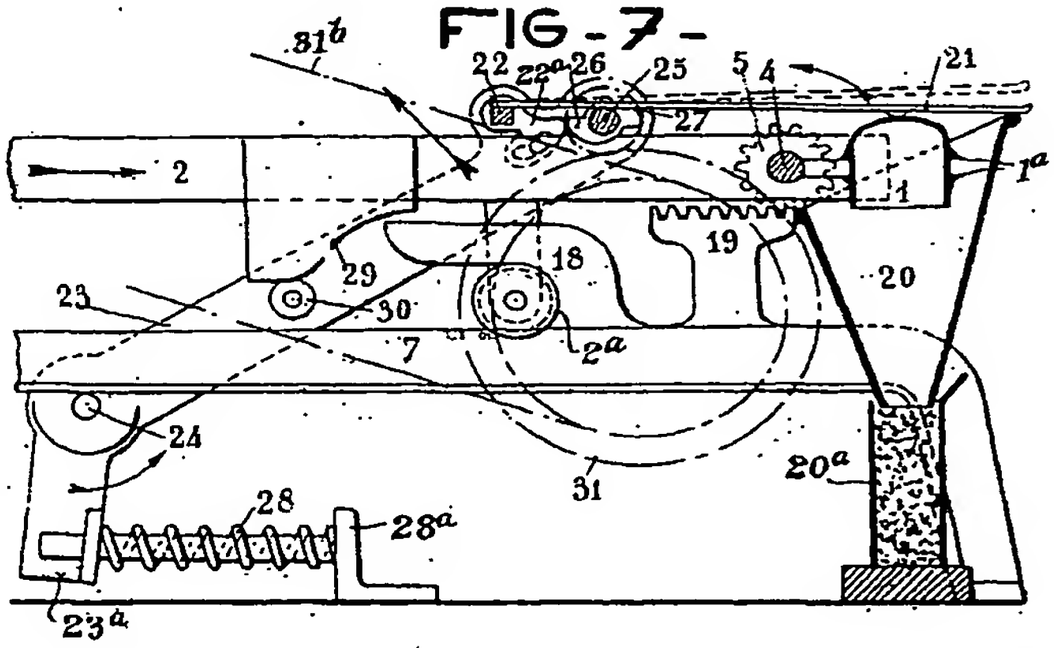


FIG - 2 -

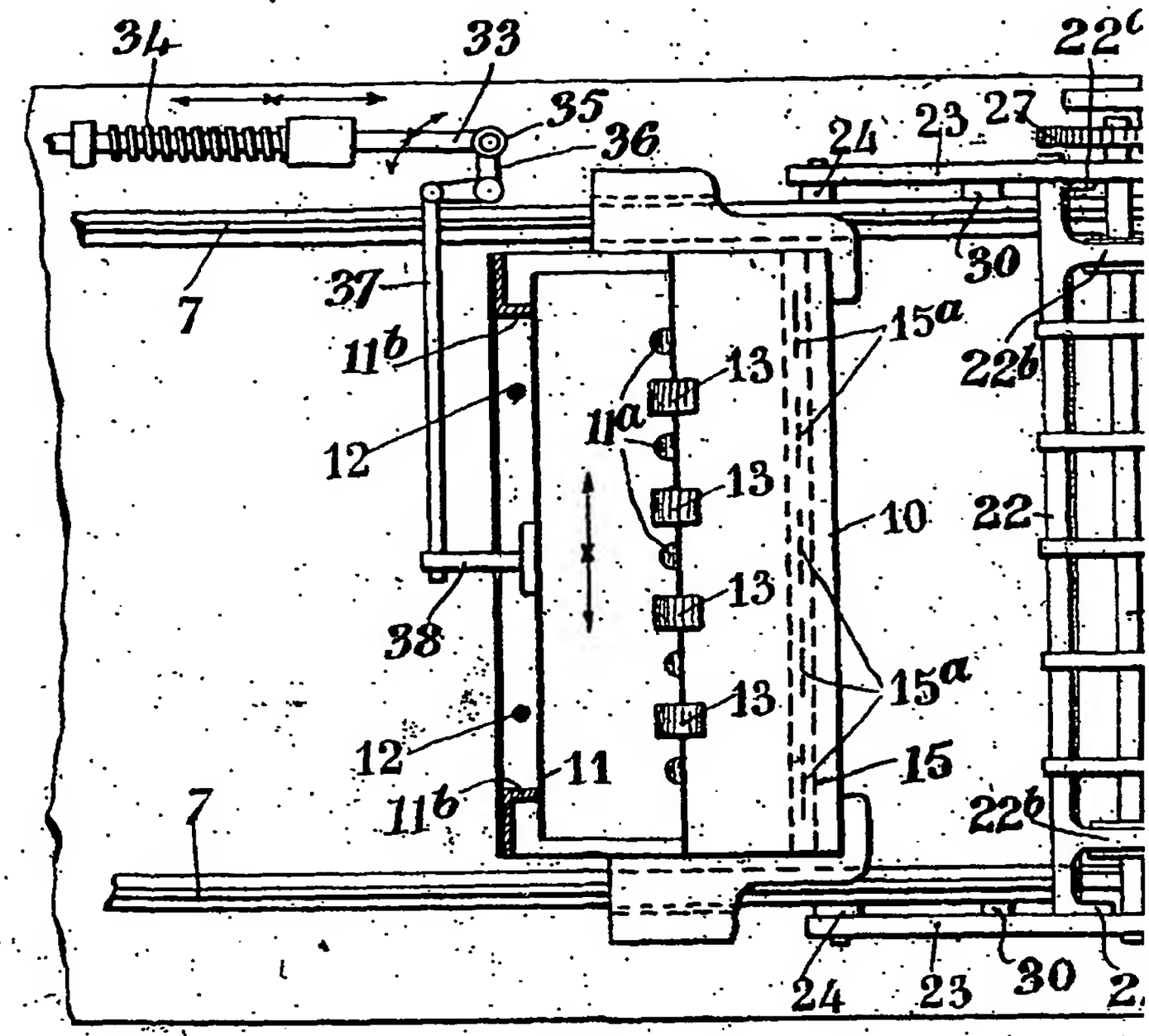


FIG - 6 -

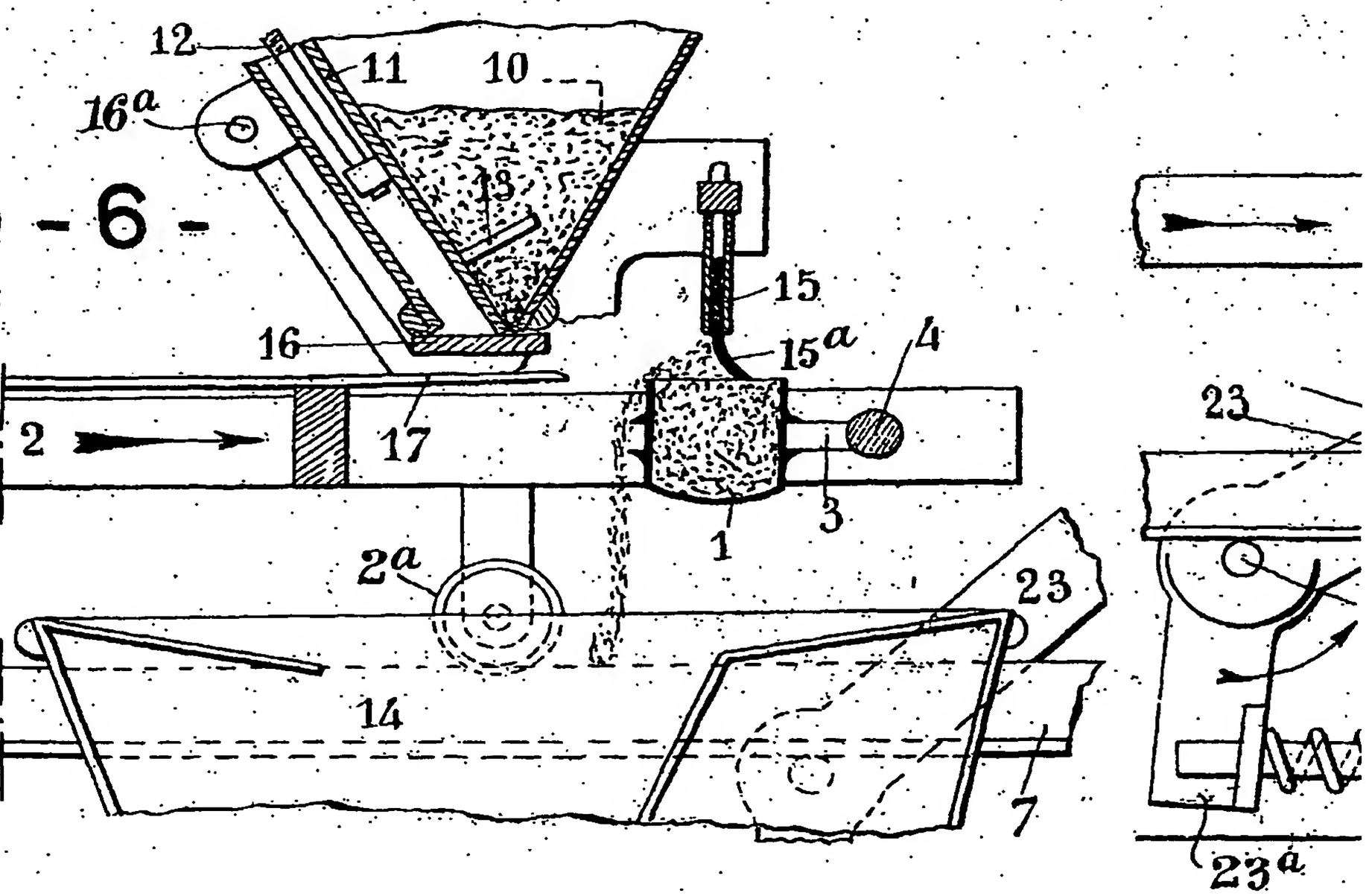


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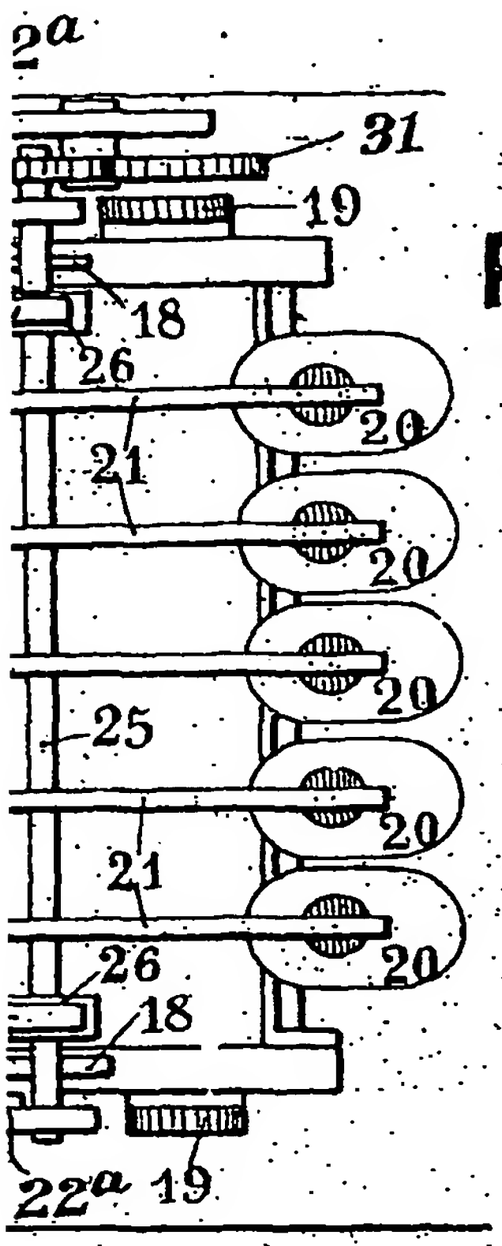
FIG - 4 -



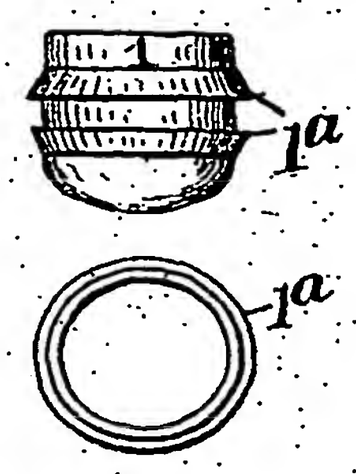


FIG - 5 -

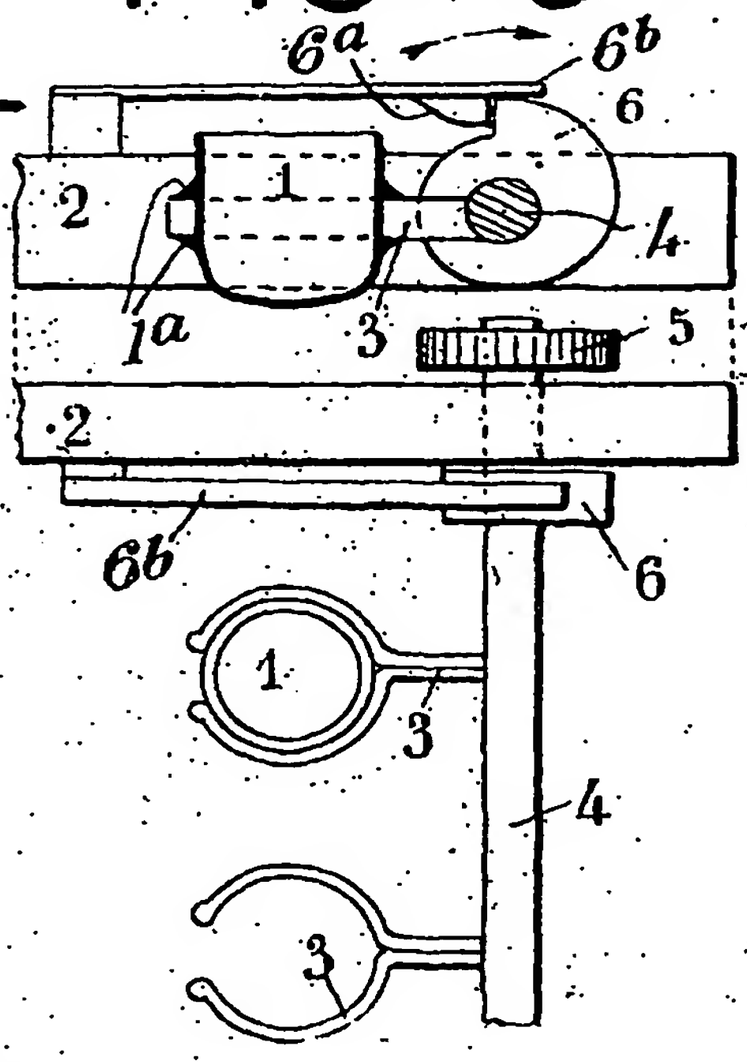
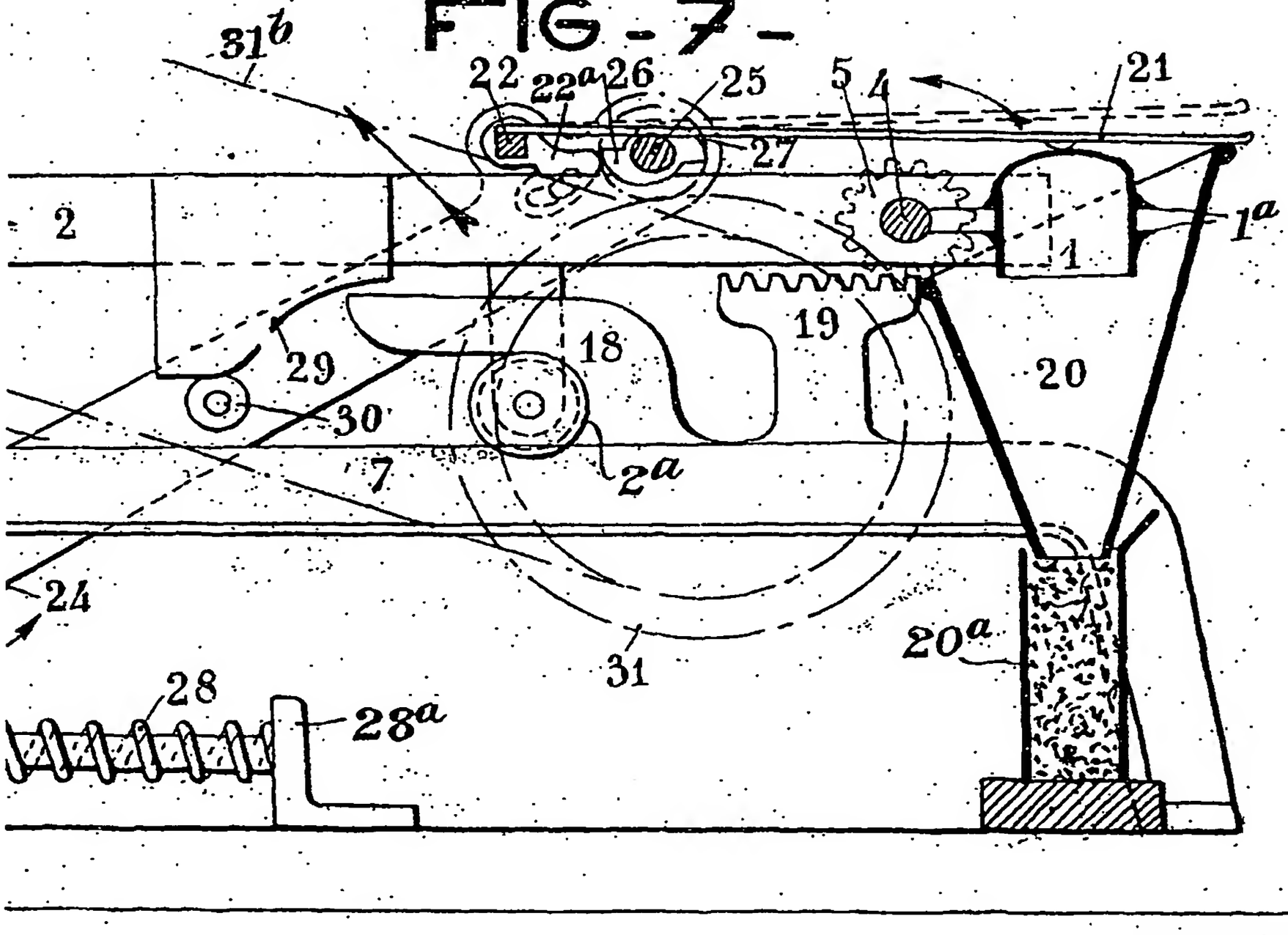


FIG - 7 -



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